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CONVERSION TO GAS IN POLAND

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In Poland, the consumer finds the modern chemist's slogan "burn gas to save coal" rather difficult to understand, because, he reasons, coal is three times cheaper than gas. For example, one cubic meter of gas, or about 4,000 kilocalories of heat, costs 50 groszy, whereas one half kilogram of coal, producing the same amount of heat, costs only 15 groszy. The chemist, however, explains that only 10 percent of the heat from coal combustion is used by the consumer. The rest of the heat and other valuable raw materials escape with the smoke.

Extensive conversion to gas in Poland has been provided for by the Six-Year Plan. The construction of 1,100 kilometers of new long-distance gas lines will complete the first stage of this conversion. Over 40 cities and settlements not supplied with gas now will be provided with gas for domestic and industrial purposes. Two new gasworks will be built, and 25 inactive gas works will be rebuilt. Furthermore, 36 new compressed-gas stations are being built to supply automobiles with gas.

In 1952, 34 percent of gas produced was coke-oven gas; 28 percent, blast-furnace gas; 24 percent, gas produced in power plants; 8 percent, natural gas; and 6 percent, municipal (illuminating) gas. Destructive distillation of coal in coking plants and gasworks was the main source of gas. Blast furnaces in metallurgical plants were the second largest source.

The problem of conversion to gas in Poland was discussed at a recent scientific and technical meeting held in Gliwice. At this meeting J. Klosinski, Master of Engineering, presented an extensive report on the subject.

A cursory description of the operation of a coking plant, or chemical plant producing coke for metallurgical use, will give an idea of the valuable raw materials that can be extracted from coal.

Finely crushed, water-moistened black coal is placed in chambers where it is roasted for several hours in the absence of air, at a temperature of about 1,000 degrees centigrade. This temperature is obtained by heating the side walls of the chamber with the coke-oven gas that escapes from the heated coal. Today 11,000 kilograms of coal are gasified in one retort in 24 hours. To produce 100,000 cubic meters of gas, 22 man-days are required. In the chambers, the heated coal clinkers and the volatile matter pass through additional equipment to be purified. Ammonia solution and tar are the first to condense. The gas is passed through sulfuric acid and the ammonia in the gas combines with the sulfuric acid thereby producing ammonium sulfate.

In the naphthalene and benzol washeries, valuable components are obtained from the gas, such as naphthalene (raw material for the production of liquid fuels and dyestuffs) and benzol or light fuel oil. Dyestuffs, drugs, plastics, explosives, and saccharin are produced from coal tar.

The Gliwice meeting opened new vistas to Polish chemistry. One cubic meter of coke-oven gas contains on an average 6.6 grams of sulfur. Thus, thousands of tons of sulfur could be obtained annually from gas.

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Ethylene (C_2H_4), an important raw material for the synthesis of solvents, explosives, etc., will likewise be obtained from coke-oven gas. In the USSR, ethylene is used to accelerate the ripening of lemons, tomatoes, and other fruits.

In his report, Klosinski pointed out the advantages of degasification of fine-grain fuel by the Lurgi method. In this method, small pellets of refractory material are placed in the chamber and heated to 1,000 degrees centigrade to increase the heated surface. This results in greater productivity per cubic meter of chamber surface. Noncoking coal, brown coal, and peat can be gasified by the Lurgi method. The residual fine coke from this process can be completely gasified, or it can be used as a fuel to heat boilers.

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